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ORIGINAL RESEARCH

The influence of isokinetic peak torque and muscular power on the functional performance of active and inactive community-dwelling elderly: a cross-sectional study

Tayla Gomes de Moura[a], **Cristiane de Almeida Nagata**[b], **Patrícia Azevedo Garcia**[b,*]

[a] *Graduation in Physical Therapy, Universidade de Brasília (UnB), Brasília, DF, Brazil*
[b] *Postgraduate Program in Rehabilitation Sciences, Universidade de Brasília (UnB) – Campus Ceilândia, Brasília, DF, Brazil*

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Abstract
Objective: To verify the importance of the isokinetic muscular torque and power of knee extensors and flexors on the functional performance of active and inactive elderly women.
Methods: A cross-sectional observational study was conducted with 116 community-dwelling women (≥60 years old) without severe cognitive and/or motor dysfunction. Isokinetic muscle function was measured by peak torque and muscle power at 60°/s (5 repetitions) and 180°/s (15 repetitions), respectively. Mobility was evaluated by means of the Timed Up and Go test (TUG) and the Habitual Gait Speed (HGS) test. Balance was evaluated via the alternate step and semitandem tests. Lower limb strength was assessed using the Sit-to-stand test. Univariate and multivariate logistic regression analysis was used to determine association between independent and dependent variables ($\alpha = 0.05$).
Result: Active elderly women had better muscle function and functional performance than inactive elderly women for almost all variables. Peak torque and muscular power of knee extensor muscles explained the dynamic balance, mobility, and lower limb strength among inactive elderly women (OR: 0.89–0.95; $p < 0.05$). Muscular power of knee flexors influenced tasks that required mobility and lower limb strength among active elderly (OR: 0.82–0.87; $p < 0.05$).
Conclusions: The muscular power of knee flexors was shown to be more important for the functional performance of active elderly women. The muscular power of knee extensors had a stronger influence on the performance of the inactive elderly women.

* Corresponding author at: Universidade de Brasília – Programa de Pós-Graduação em Ciências da Reabilitação, Centro Metropolitano, Conjunto A, Lote 01, Ceilândia, Brasília, DF CEP: 72220-900, Brazil.
E-mail: patriciaagarcia@unb.br (P.A. Garcia).

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Introduction

Aging has repercussions for several changes in the structure and function of all systems of the body.[1] Among these changes, loss of muscle mass has been shown to be one of the most important since it affects muscle function, evidencing losses of 20–40% of strength up to the eighth decade of life[2] and decreased muscle power by up to 41 W in elderly of different age groups.[3] These changes in muscle function may interfere with the functional performance of the elderly in tasks that require strength, balance and mobility.[4–6]

The function of knee extensor and flexor muscles has been shown to predict functional performance in community-dwelling elderly.[4–6] Peak torque and muscular power influence the ability of the elderly to perform transfers and have demonstrated a low to moderate relationship with mobility[5,6] and with body balance.[6–8] These physical parameters of muscle function also relate to the strength of lower limbs required for the task of sitting and standing up from a chair.[5,9,10]

Investigations indicate the important contribution of the practice of physical activity for the maintenance of physical and functional performance in the elderly.[11,12] The regular practice of physical activity was able to predict 19–29% of the functional performance of the elderly of the community, and those with higher levels of physical activity present higher scores on balance, mobility and lower limb strength tests.[13,14] In addition, the level of physical activity of the elderly still living in the community also shows a positive relationship with the strength and power of the knee musculature.[13] However, studies have shown that the functional performance of active and inactive elderly individuals for the same task can be differently influenced by the muscular activation of knee extensors or flexors.[15,16]

In this context, there appears to be a consensus in the literature on the influence of muscle function of knee extensors and flexors on the functional performance of community-dwelling elders.[5–8] However, there is still a disagreement in the literature about the association between physical parameters of muscle function and functional performance in elderly individuals with different levels of physical activity.[13,14] Thus, this study verified the influence of the isokinetic muscle function of knee flexors and extensors on the functional performance of active and inactive elderly women in terms of balance, mobility and lower limb strength tests.

Methods

Study design and participants

This is an observational cross-sectional study approved by the Research Ethics Committee of the Secretary of State for Health of the Federal District, Brasília, Federal District, Brazil (number 174/2011). All participants signed the Informed Consent Form.

The convenience sample was recruited into elder care programs. The sample consisted exclusively of women who participated in a project that advises elderly women on osteopenia and osteoporosis. Inclusion criteria were: age ≥60 years, independent gait,[17] absence of cognitive alterations in the Mini-Mental State Examination (MMSE),[18] absence of severe dysfunctions in the visual system and of impairments in the lower limbs, absence of history of rheumatoid arthritis, Parkinson's disease, stroke, peripheral arterial obstructive disease[17] and/or vestibulopathies.

To determine the level of physical activity, participants were asked how many minutes per week they practiced moderate intensity exercise and were categorized into a group of active elderly women (≥150 min of activity per week) and a group of inactive elderly women (<150 min of activity per week).[19] Based on the sample calculation with ten active elderly women and ten inactive elderly women, a sample size of 58 participants in each group was required for a power of 80% and an alpha error of 0.05 in the correlation analyses between the dependent and independent variables.

Variables and measuring instruments

In order to characterize the sample in terms of age, continuous use of medications, regular practice of physical activity and nutritional status, participants answered a questionnaire developed by the researchers. Height and the body mass were measured to calculate Body Mass Index (BMI) and for subsequent classification of nutritional status.[20]

Isokinetic muscle function characterized the independent variable. Static and dynamic balance, body mobility and lower limb muscle strength characterized the dependent variables.

Isokinetic muscle function was evaluated by means of the peak torque by body weight and mean muscle power, which were measured in the isokinetic dynamometer Biodex System 4 Pro® (Biodex Medical Systems Inc., Shirley, NY, USA). After previous instruction, each volunteer was seated. Stabilization, joint alignment and familiarization with a maximal repetition and two submaximals associated with gravity correction were performed. Then the chair was aligned at 85° and the thigh, pelvis and trunk segments were stabilized with the straps from the equipment itself. The rotational axis of the apparatus was aligned with the lateral femur epicondyle, and the lever cushion was positioned three centimeters above the lateral malleolus and the range of motion (ROM) tested was limited to 85° from the 90° flexion angle of the knee. Measurements of both limbs were obtained. Measurements were initially collected for the non-dominant lower limb. However, for analysis of the results, only the measurements of the dominant limb (the preferred limb used for kicking a ball) were used. Concentric contractions with constant and predetermined angular velocities were performed: five repetitions were performed at 60°/s for the evaluation of the peak torque by body weight, while for the evaluation of the average muscular power, 15 repetitions were performed at 180°/s. A two-minute rest interval was used between the tests in order to reduce the possible effects of fatigue on the participants' performance. In addition, during the test volunteers were coached to exert effort using incentive phrases such as ''force up'', ''force down'', ''try to hit the top'' and ''try to hit the bottom'' accompanied by clapping.[3]

Static balance was evaluated through the semitandem test. Participants were instructed to remain in the orthostatic position by placing one foot in front of the other, with a lateral and frontal distance of 2.5 cm between the feet. Static balance was considered normal when the participant demonstrated the ability to remain in this position for ten seconds or more with eyes closed.[21]

Dynamic balance was evaluated by the alternate step test. The volunteers were instructed to place their heels as quickly as possible on a 15 cm high step, alternating feet for eight repetitions. The stopwatch was started as soon as the examiner transmitted the command ''go'' and stopped after the eighth repetition. Times greater than ten seconds was indicative of deficiency in dynamic balance.[22]

Body mobility was evaluated by means of the Timed Up and Go (TUG) test and the Habitual Gait Speed (HGS) test. For the TUG, volunteers were instructed to lift themselves from a seated position on a 43-cm-high chair, without the aid of the upper limbs, and to walk quickly for 3 m, returning to a seated position in the chair after a 180° turn. The measurement in seconds was taken by means of a stopwatch that was started with the ''go'' command by the evaluator and stopped when the volunteer returned and placed their back against the chair backrest in a single attempt.[17] A time of ten seconds was adopted as the cutoff point for identification of mobility limitation.[23] For the evaluation of HGS, volunteers were instructed to walk a distance of 4.6 meters at a comfortable speed on a flat surface. The distance was divided by the time elapsed, and 1 m/s was considered the cut-off point for mobility limitation.[24]

Muscle strength of lower limbs were assessed using the Sit-to-stand test (STS). Participants were instructed to stand up and sit five times on a 43-cm-high chair at the highest possible speed, with the upper limbs crossed at the chest. The stopwatch was stopped at the end of the last repetition, and a time of 12 s was considered as the cutoff point to identify muscle strength deficiency.[22]

Data was collected on two different days of the same week. On the first day, clinical and demographic data were collected at the participants' residence. On the second day, physical–functional data were collected at the Laboratory of Human Functioning Performance of the University of Brasília: (I) Body Mass Index (BMI), (II) functional tests and (III) isokinetic evaluation. The order of the tests was not randomized. The same evaluator made all physical–functional assessments. The evaluator was blinded to the level of physical activity of the elderly (active or inactive).

Statistical analysis

For the analysis of the independent and dependent variables of this study, there were no missing data. The continuous data were analyzed descriptively using measures of central tendency (mean) and variability (standard deviation). The categorical data were presented as frequency and percentage. The normal distribution of the data was identified using the Kolmogorov–Smirnov test. To compare active and inactive elderly groups, *t*-Student test for independent samples were used for continuous data and chi-square for categorical data. Univariate logistic regression analysis was used to determine the association between independent and dependent variables, and, consequently, to verify the parameters of isokinetic muscle function that contributed to functional performance. The identification of lower limb muscle weakness, static or dynamic balance disability, and mobility limitation was categorized as Category ''1'' for the logistic regression analyses. Odds ratios (OR) were calculated for each explanatory variable with 95% confidence intervals. Subsequently, variables that showed a *p*-value less than 0.20 in the univariate regression analysis were included in the multivariate logistic regression analysis with the objective of investigating the independent effect, when together, of these variables to predict functional performance. During the analyses, multicollinearity was considered, with tolerance <0.1 and FIV > 10. A significance level of 5% was considered. The statistical analyses were processed using the Statistical Package for Social Sciences (SPSS), version 16.0.

Results

The sample of this study was composed of 116 community-dwelling elderly women who participated in all phases of the evaluation (Flowchart, Fig. 1). Of these, 51.7% were classified as active. The characteristics of the study sample are presented in Table 1. The groups were homogeneous in terms of age, quantity of continuous use medications and nutritional status.

The physical–functional data showed that active elderly had significantly better isokinetic muscle function than inactive elderly women, as well as lower dynamic balance deficiency (30% vs 55.4%), better body mobility in the TUG test (7.85 s vs 9.14 s) and lower frequency of lower limb muscle strength deficiency (25% vs 46.4%) (Table 2).

Logistic regression analyses have shown that better isokinetic muscle functioning is a protective factor against the loss of balance, body mobility and lower limb muscle strength (Table 3). In these analyses stratified by regular practice of physical activity, the power of knee extensor muscles was associated with dynamic balance (OR = 0.91 [95% CI: 0.83, 0.99]; b-weights = −0.095; *p*-value = 0.045), with mobility in the Habitual Gait Speed test (OR = 0.90 [95% CI: 0.82, 0.99]; b-weights = −0.103; *p* = value = 0.028) and with the lower limb muscular strength test (OR = 0.89 [95% CI: 0.80, 0.98]; b-weights = −0.121; *p*-value = 0.024) in inactive elderly. Thus, an increase of one watt of knee extensor power decreases the chance of presenting dynamic balance deficiency by 9%, the chance of presenting gait mobility limitation by 10%, and the chance of presenting a limitation of standing up and sitting in a chair by 11%. Likewise, an increase of 10 watts of muscle power in this muscle decreased the chance of presenting dynamic balance deficiency by 61.4%, the chance of presenting gait mobility limitation by 64.3% and the chance of presenting a limitation of standing up and sitting on a chair by 70.2%. In addition, the peak torque of knee extensors was associated with dynamic balance (OR = 0.95 [95% CI: 0.90, 0.99]; b-weights = −0.051; *p* = 0.037) and the mobility investigated by the TUG (OR = 0.95 [95% CI: 0.91, 0.99]; b-weights = −0.055; *p* = 0.041). Thus, the elderly women with 10 more Newton-meters of knee extensors torque decrease the chance of presenting dynamic balance deficiency by 40% and the chance of presenting mobility limitation for the TUG by 42.4%.

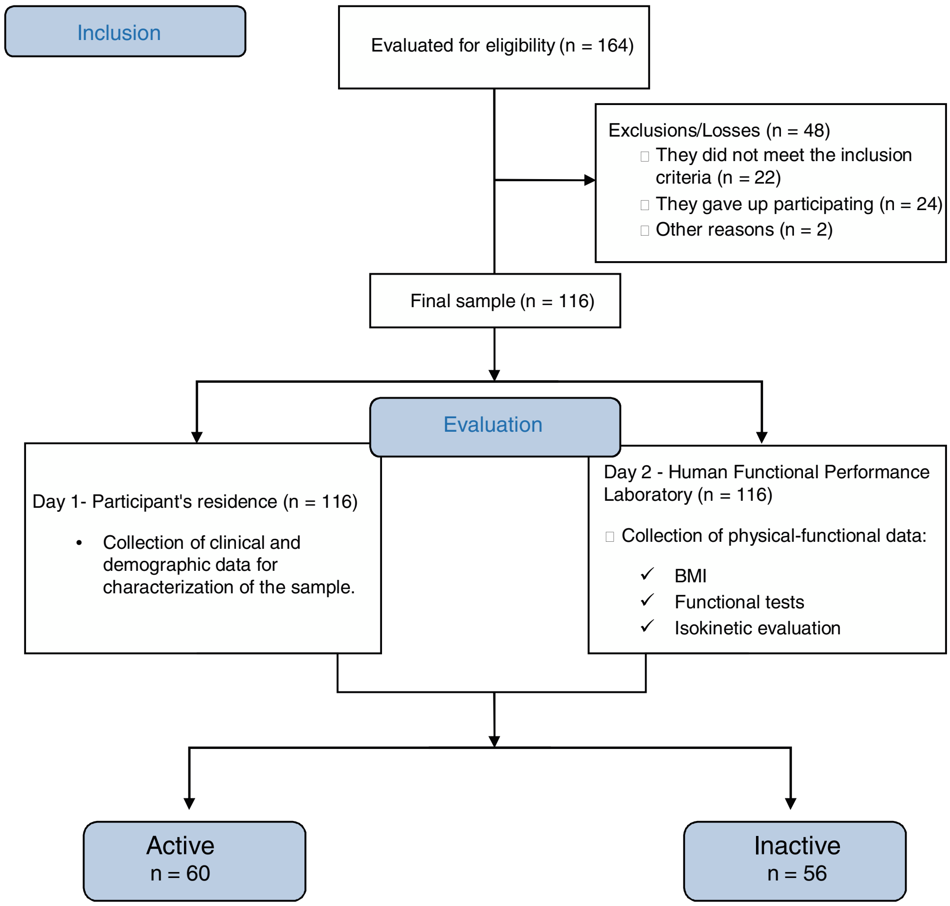

Figure 1 Sample selection flowchart.

Table 1 Clinical and demographic characteristics of the sample.

Variables	Active ($n = 60$)	Inactive ($n = 56$)	p-Value
Age†	69.95 (6.32)	70.88 (6.06)	0.479
Quantity of medications in continuous use†	4.07 (2.34)	5.02 (2.54)	0.477
Nutritional state (BMI)†	27.20 (4.06)	27.25 (5.02)	0.053
Thinness‡	6.7 (4)	12.5 (7)	
Eutrophy‡	46.7 (28)	42.9 (24)	0.560
Overweight‡	46.7 (28)	44.6 (25)	

BMI, body mass index. †Mean (standard deviation). ‡Percentage (absolute frequency). †t-Student test for independent samples. ‡Chi-square test. *$p < 0.05$ for comparison of active and inactive group.

However, among the active elderly, muscle power of knee flexors was associated with muscle strength deficiency (OR = 0.82 [95% CI: 0.72, 0.95]; b-weigths = −0.193; p-value = 0.006) and with the limitation of mobility in HGS (OR = 0.87 [95% CI: 0.75, 0.99]; b-weigths = −0.141; p-value = 0.047). In these elderly patients, the increase of one watt of knee flexor muscle power decreased the chance of muscular strength deficiency by 18%, and the chance of gait limitation by 13%. Likewise, an increase of 10 watts of power in this muscular function decreased the chance of being unable to sit and stand up from a chair by 85.5% and the chance of having a slow gait by 75.6%.

Discussion

In the present study, peak torque and power of the knee flexor and extensor muscles showed a significant relationship with the functional performance of active and inactive elderly women in terms of mobility, balance and lower limb strength tests. This relationship presented variations according to the level of physical activity of the participants. The functional performance was shown to be more influenced by the knee flexor muscular power among the active elderly women and by the knee extensor peak torque and muscle power among the inactive elderly women.

Table 2 Functional and muscular isokinetic performances of active and inactive elderly.

Variables	Active ($n = 60$)	Inactive ($n = 56$)	Mean difference [95% CI]	p-Value
Body balance				
Alternate step (s)[†,*]	9.39 (2.82)	11.33 (4.00)	1.93 [0.66, 3.20]	0.003
Alternate step disability[‡,*]	30.0 (18)	55.4 (31)	–	0.008
Deficiency in semitandem[‡]	15.0 (9)	14.3 (8)	–	0.562
Body mobility				
TUG (s)[†,*]	7.85 (1.83)	9.14 (3.98)	1.30 [0.17, 2.42]	0.029
Mobility limitation on TUG[‡]	11.7 (7)	26.8 (15)	–	0.057
HGS (m/s)†	1.23 (0.23)	1.15 (0.30)	−0.08 [−0.18, 0.02]	0.131
Limitation of mobility in HGS[‡]	16.7 (10)	32.1 (18)	–	0.081
Lower limbs muscular strength				
Sit-to-stand test[†,*]	10.91 (3.55)	12.71 (3.90)	1.80 [0.43, 3.17]	0.011
Lower limb muscle strength deficiency[‡,*]	25.0 (15)	46.4 (26)	–	0.020
Isokinetic muscle function				
Extensor peak torque (N m/kg)[†]	121.35 (32.86)	110.16 (28.28)	−11.18 [−22.50, 0.13]	0.053
Flexor peak torque (N m/kg)[†,*]	58.05 (14.96)	50.09 (16.73)	−7.96 [−13.79, −2.13]	0.008
Extensor muscle power (W)[†,*]	68.70 (18.84)	56.81 (19.78)	−11.89 [−18.99, −4.78]	0.001
Flexor muscle power (W)[†,*]	35.20 (14.14)	27.94 (14.50)	−7.26 [−12.53, −1.99]	0.007

TUG, Timed Up and Go; HGS, Habitual Gait Speed. [†]Mean (standard deviation) (*T*-student test for independent samples). [‡]Percentual (absolute frequency) (Chi-square test). *$p < 0.05$ for comparison between active and inactive group.

Despite the relevant relationships observed between isokinetic muscle function and functional performance, the multivariate analysis of the present study mainly reinforced the importance of knee extensor muscle strength for functional performance in dynamic activities, exclusively among inactive elderly women. In the study by Carter et al.[25] the strength of knee extensors explained 26% of the dynamic balance of elderly women with osteoporosis, demonstrating that an increase of 1 kg/m in muscle strength was associated with a 2.4% improvement in dynamic balance. Barbat-Artigas et al.[4] found that the elderly women who presented weak lower limb strength in the lower quartile had a 6.12 times greater chance of presenting self-reported mobility limitations. Although the present study did not detect a relationship between the extensors peak torque and the mobility in the gait speed test, a previous study showed that weaker elders were 11.66 times more likely to present a limitation of habitual gait speed and 18.41 times more likely to have a fast gait speed limitation than stronger older women.[4] The inability of the peak torque of knee muscles to predict performance in the sit and stand up from a chair activity was also demonstrated by McCarthy et al.[10] in two variations of the STS test. However, later investigations have observed that the peak torque of these muscle groups explained between 33 and 42% of the functional performance in this test ($r^2 = 0.42$; $p = 0.004$)[9,26] and that weaker elders were 23.95 times more likely to present a limitation in this activity than the stronger ones.[4] In view of these findings it seems that peak torque more accurately explains the performance of the elderly,[6] but in the present study, this influence was not observed among active older women in any of the investigated activities. This result suggests that even seemingly small changes in extensor muscle strength due to inactive aging may lead to large detrimental changes in functional performance among inactive elders. Likewise, the maintenance of or small increases in extensor muscle strength among active elders may lead to little or no change in functional performance.[27]

A systematic review by Byrne et al.[28] pointed out that power is the variable of muscle function that best predicts the functional performance of the elderly, and 31–50% of the performance of the elderly in functional tests was explained by the power of the knee extensor muscles. However, it seems that this influence of knee muscular power differs between active and inactive elders. In our multivariate regression analysis, we emphasized the importance of knee flexor power to maintain gait and muscle strength among the active elderly women and the muscular power of knee extensors for dynamic balance, gait and muscle strength among inactive women. Previous studies have also shown that among the elderly who did not practice physical activity, muscle power of knee extensor was able to explain 34% ($p = 0.009$) of the performance when performing the maximum speed test and 51% ($p = 0.000$) of obstacle gait speed,[29] as well as about 32–40% ($p < 0.0001$) of self-reported functional performance in basic and instrumental activities of daily living and in the mobility of sedentary elderly women aged 70 years and over.[30] Additionally, Korff et al.[16] identified lower relative knee flexor power ($p = 0.007$) among sedentary elderly when compared to active elderly, and discussed the important contribution of other muscle groups to perform complex functional tasks in inactive elderly. Previous findings emphasize that regular physical activity is an important modifier of intermuscular coordination capabilities that are fundamental for functional performance in multi-articular tasks, reducing the influence of muscle strength or power of a single joint between active seniors.[16] Additionally, changes

Table 3 Univariate and multivariate logistic regression analysis to verify associations between isokinetic muscle performance of knee extensor and flexor muscles and functional performance among active and inactive elderly.

Isokinetic variable	Active elderly ($n = 60$)					Inactive elderly ($n = 56$)				
	Dynamic balance	Static balance	Mobility – TUG	Mobility – HGS	Muscle strength	Dynamic balance	Static balance	Mobility – TUG	Mobility – HGS	Muscle strength
Univariate analysis										
Peak torque of extensor muscles	0.98 (0.96–1.00)**	0.98 (0.96–1.00)**	0.98 (0.96–1.00)**	0.98 (0.96–1.00)**	0.98 (0.96–0.99)*	0.94 (0.91–0.97)*	1.00 (0.98–1.03)	0.94 (0.91–0.98)*	0.95 (0.92–0.98)*	0.95 (0.92–0.98)*
Power of extensor muscles	0.96 (0.92–0.99)*	0.97 (0.94–1.01)**	0.92 (0.86–0.98)*	0.99 (0.87–0.97)*	0.95 (0.92–0.99)*	0.91 (0.87–0.96)*	0.99 (0.95–1.03)	0.923 (0.88–0.97)*	0.89 (0.83–0.95)*	0.90 (0.84–0.95)*
Peak torque of flexor muscles	0.94 (0.90–0.98)*	0.99 (0.94–1.03)	0.94 (0.88–0.99)*	0.94 (0.90–0.99)*	0.92 (0.88–0.97)*	0.95 (0.91–0.99)*	0.97 (0.93–1.02)	0.95 (0.91–0.99)*	0.96 (0.92–0.99)*	0.93 (0.89–0.97)*
Power of flexor muscles	0.93 (0.88–0.97)*	0.97 (0.92–1.02)	0.88 (0.81–0.96)*	0.88 (0.81–0.95)*	0.88 (0.83–0.95)*	0.93 (0.89–0.98)*	0.97 (0.91–1.02)	0.92 (0.87–0.97)*	0.92 (0.87–097)*	0.91 (0.86–0.96)*
Multivariate analysis										
Peak torque of extensor muscles	1.00 (0.97–1.04)	0.99 (0.96–1.02)	0.98 (0.92–1.04)	0.99 (0.95–1.05)	0.98 (0.94–1.03)	0.95 (0.90–0.99)*	–	0.95 (0.91–0.99)*	0.97 (0.92–1.01)	0.99 (0.95–1.04)
Power of extensor muscles	0.99 (0.93–1.05)	0.98 (0.94–1.03)	0.99 (0.89–1.09)	0.98 (0.90–1.08)	1.07 (0.99–1.16)	0.91(0.83–0.99)*	–	0.97 (0.90–1.05)	0.90 (0.82–0.99)*	0.89 (0.80–0.98)*
Peak torque of flexor muscles	0.96 (0.88–1.05)	–	1.06 (0.92–1.22)	1.04 (0.91–1.18)	1.01 (0.90–1.14)	1.00 (0.92–1.09)	–	1.03 (0.95–1.13)	1.04 (0.95–1.15)	0.94 (0.85–1.03)
Power of flexor muscles	0.96 (0.87–1.05)	–	0.88 (0.75–1.02)	0.87 (0.75–0.99)*	0.82 (0.72–0.95)*	1.07 (0.94–1.21)	–	0.96 (0.84–1.08)	0.99 (0.87–1.14)	1.06 (0.93–1.20)

Multivariate binary logistic regression with foward likelihood ratio method. Data expressed in OR (95% CI). ** $p < 0.20$ in the univariate analysis (variables were included in the multivariate regression analysis). * $p < 0.05$. TUG, Timed Up and Go test; HGS, Habitual Gait Speed; STS, Sit-to-stand test.

induced by the aging process also include increased muscles co-activations, so it is possible that the practice of physical exercise has modified the coordination and co-activation patterns of muscles, differently influencing functional performance.[31,32] Specifically during the gait, the increased support phase[33] observed in aging and the possibility of being more pronounced among inactive women contributes to the understanding of the greater influence of knee extensor power in this group of elderly women. Likewise, the greater muscular control of the knee flexor muscles acquired with the practice of physical exercise would prevent knee hyperextension[34] in the support phase, leading to a greater influence on gait performance among the active elderly women.

Additionally, it should be noted that none of the isokinetic muscle function variables evaluated in this study explained the performance of the elderly in the task requiring static balance. It is believed that this result can be justified by the dynamic character of the performed evaluation of the muscular function, since the performance in this activity requires greater activation of static muscles. This hypothesis is strengthened by the results found by Carty et al.,[35] which demonstrated that it is the isometric force of knee extensors that maintains a significant relation with the capacity of maintaining static balance in community-dwelling elderly. These authors found that the reduction of one unit of isometric strength of the knee extensor meant a 1.7-fold increase in the chance of using a multi-step strategy in response to small and medium intensity disorders, and 1.9 fold increase in high intensity disturbances. Likewise, the knee flexor muscles were also related to a greater chance of using this strategy in response to medium and high intensity disturbances (OR = 1.8 [95% CI 1.0–3.1] and OR = 2.4 [95% CI 1.3–4.5], $p < 0.05$, respectively).

The findings of the present study demonstrated that the relation between muscular function and functional performance was higher among inactive elderly women. In clinical practice, these results suggest that, in the case of primarily inactive elderly women, the training of peak torque and muscular power of knee extensors deserves to receive attention in order to improve functional performance. However, they indicate that, among active elderly, other clinical and physical factors may become more important to ensure good performance in the functional activities evaluated and should be extensively investigated in future studies.

Previous studies have pointed out that functional performance is highly influenced by sedentary lifestyle (OR = 2.37 [1.60–3.51]; $p < 0.001$ and OR = 19.5 [6.64–57.71]; $p < 0.05$), by age ($r = -0.28$ to -0.35 in male elderly, and $r = -0.44$ to -0.58 in female elderly, with $p < 0.001$), and through the use of medication (OR = 2.2 [1.34–3.8]; $p < 0.05$).[36,37] The present study controlled these influences by stratifying the analyses between active and inactive and keeping the two groups of elderly homogeneous in terms of age, quantity of medications and nutritional status. Despite these important controls, limitations were observed in the analysis of strictly female elderly subjects and in the non-inclusion of other factors that could influence the functional performance of the elderly.

Conclusion

In conclusion, the present study verified an important influence of peak torque and muscle power of knee extensors on functional performance in activities involving dynamic balance, mobility and lower limbs muscle strength among inactive elderly women and the influence of knee flexor muscle power in activities of mobility and lower limb muscle strength among active elderly women. Physical therapists should be aware of these differences by implementing specific training aimed at improving functional capacity in the elderly with different levels of physical activity.

Conflicts of interest

The authors declare no conflicts of interest.

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